

CLAIMS:-

1. An energy storage device including:
 - a housing having two terminals;
 - an electrochemical device disposed within the housing for providing an electrical potential between the terminals; and
 - a first capacitor mounted to the housing and being electrically connected to the terminals in parallel with the electrochemical device.
2. An energy storage device according to claim 1 wherein the capacitor extends about the housing.
3. An energy storage device according to claim 2 wherein the housing is cylindrical and extends between two opposed axially spaced apart ends, whereby the ends define respective terminals and the capacitor extends about the housing intermediate the ends.
4. An energy storage device according to claim 1 wherein the capacitor is an electric double layer supercapacitor including:
 - a capacitor housing;
 - a first and a second opposed sheet electrodes disposed within the housing and being respectively electrically connected to the terminals;
 - a separator located between the electrodes; and
 - an electrolyte intermediate the electrodes for allowing charge to be stored at the electrodes.
5. An energy storage device according to claim 1 wherein the capacitor is flexible and wrapped about the housing.

6. An energy storage device according to claim 1 wherein the capacitor is flexible and configured as a tube that is disposed within the housing.
7. An energy storage device according to claim 1 wherein the capacitor is wrapped around the electrochemical device.
- 5 8. An energy storage device according to claim 1 wherein the electrochemical device is generally cylindrical and extends between two opposed axially spaced apart ends and the first capacitor extends axially away from one of the ends.
9. An energy storage device according to claim 8 including a second capacitor which has an aperture for receiving the electrochemical device.
- 10 10. An energy storage device according to claim 9 wherein the aperture receives both the electrochemical device and the first capacitor.
11. An energy storage device according to claim 9 wherein the second capacitor is tubular and extends about the first capacitor and the electrochemical device.
12. An energy storage device according to claim 1 wherein the electrochemical device is a battery and the capacitor is an electric double layer supercapacitor.
- 15 13. An energy storage device according to claim 12 wherein the battery is a Li-Ion battery.
14. An energy storage device according to claim 13 wherein the Li-Ion battery includes a solid electrolyte.
- 20 15. An energy storage device according to claim 14 wherein the electrolyte includes a polymer.

16. An energy storage device according to claim 1 wherein the electrochemical device and the capacitor each include a pair of electrodes that are electrically connected to the respective terminals.
17. An energy storage device according to claim 16 wherein the electrodes are fixedly connected to the respective terminals.
18. An energy storage device according to claim 16 wherein at least one of the electrodes of the supercapacitor are selectively electrically isolated from the terminals.
19. An energy storage device according to claim 18 including a switch that is electrically disposed between one of the terminals and one of the electrodes of the capacitor for effecting the selective electrical isolation.
20. An energy storage device according to claim 1 wherein the electrochemical device and the capacitor each include a power density and an energy density, wherein the energy density of the electrochemical device is greater than the energy density of the capacitor and the power density of the electrochemical device is less than the power density of the capacitor.
21. An energy storage device including:
 - a housing having two terminals; and
 - a first capacitor forming part of the housing and connected to the terminals.
22. An energy storage device according to claim 21 wherein the housing has a form factor corresponding or being related to battery size designations N, AAAA, AAA, AA, C or D.
23. An energy storage device according to claim 21 wherein an electrochemical device is disposed within the housing for providing electrical energy to the terminals.

24. An energy storage device according to claim 21 wherein the device extends about the housing.

25. An energy storage device according to claim 21 wherein the housing is cylindrical and extends between two opposed axially spaced apart ends, whereby the 5 ends define respective terminals and the capacitor extends about the housing intermediate the ends.

26. An energy storage device according to claim 21 wherein the capacitor is an electric double layer supercapacitor including:

10 a capacitor housing;

15 a first and a second opposed sheet electrodes disposed within the housing and being respectively electrically connected to the terminals;

20 a separator located between the electrodes; and

25 an electrolyte intermediate for allowing charge transfer between the electrodes.

27. An energy storage device according to claim 21 wherein the capacitor is flexible and wrapped about the housing.

30. An energy storage device according to claim 21 wherein the capacitor is flexible and configured as a tube that is disposed within the housing.

28. An energy storage device according to claim 21 wherein the capacitor is flexible around the electrochemical device.

29. An energy storage device according to claim 21 wherein the electrochemical device is generally cylindrical and extends between two opposed axially spaced apart ends and the first capacitor extends axially away from one of the ends.

31. An energy storage device according to claim 21 wherein the energy storage device is of hollow construction with an aperture for receiving the electrochemical device.

32. An energy storage device according to claim 31 wherein the aperture receives 5 both the electrochemical device and a second capacitor.

33. An energy storage device according to claim 32 wherein the first capacitor is tubular and extends about the second capacitor and the electrochemical device.

34. An energy storage device including:
a housing having an interior and an exterior where the interior defines a cavity;
10 two terminals disposed on or adjacent to the exterior of the housing for electrically engaging with respective terminals of a load that requires a predetermined load current;
an electrochemical device disposed within the cavity and being electrically connected to the terminals for providing a first current to the load; and
15 a capacitor disposed within the cavity and being electrically connected to the terminals in parallel with the electrochemical device for providing a second current to the load, whereby the first current and the second currents collectively sum to the predetermined load current.

35. An energy storage device according to claim 34 wherein the electrochemical 20 device includes an anode and a cathode that are respectively fixedly electrically connected to the terminals by way of an anode tab and a cathode tab, and the capacitor includes a positive electrode and a negative electrode that are respectively fixedly

electrically connected to the terminals by way of a positive electrode tab and a negative electrode tab.

36. An energy storage device according to claim 35 wherein the terminals extend from the interior to the exterior and the anode tab, the cathode tab, the positive electrode tab, 5 and the negative electrode tab are disposed entirely within the cavity.

37. An energy storage device according to claim 34 wherein the capacitor is an electric double layer supercapacitor including:

a capacitor housing;
a first and a second opposed sheet electrodes disposed within the housing and 10 being respectively electrically connected to the terminals;
a separator located between the electrodes; and
an electrolyte intermediate for allowing charge transfer between the electrodes.

38. An energy storage device according to claim 36 wherein the housing is flexible.

39. An energy storage device according to claim 38 wherein the energy storage 15 device is flexible.

40. An energy storage device according to claim 36 wherein the housing and the electrochemical device are rigid and the capacitor is flexible and packed about the electrochemical device.